

3

The Connecticut Distance Learning Consortium and thirty-one institutional partners are using e-portfolios for a wide variety of learning and assessment purposes.

Enhancing Learning and Assessment Through e-Portfolios: A Collaborative Effort in Connecticut

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The most positive result of the e-portfolio project for students was their ability to make a connection between their coursework and the program goals and institutional outcomes. Often students only think they are completing course requirements and they are totally unaware of the bigger picture of program and institutional outcomes that are being achieved.

Survey of e-portfolio users, Tunxis Community College, 2006

E-portfolios are a rich, flexible tool for teaching, learning, and assessment. They provide institutions with a way to assess how well they are educating their students. At the same time, they provide students with a way to better understand their educational experience and achievements and how these are linked to their personal goals. With e-portfolios, students have access to a virtual platform for sharing their goals, achievements, and insights with advisers and counselors to ensure that they are meeting their career and educational goals. And this same tool allows students to demonstrate their achievements to others, including future employers. Implementing e-portfolios requires planning, new procedures, new ways of thinking, additional resources, and training both faculty and students. Institutions working in collaboration can bring an added richness to the process. The ability to share resources, implementation processes, insights into training, and tips for working with faculty

and students has made a major difference to the Connecticut institutions involved in a collaborative e-portfolio project.

At Tunxis Community College, all students enrolled in the computer information systems program are using e-portfolios to develop a collection of work as both a showcase for potential employers and a programmatic assessment tool. The dental hygiene students are using e-portfolios throughout their program to demonstrate their competencies. Albertus Magnus College is exploring the potential of using e-portfolios to assess student learning outcomes in the general education program. At Capital Community College, e-portfolios are being used to improve student learning in the College Success course, a first-year orientation experience. At Northwestern Connecticut Community College, e-portfolios are being used as a learning connection between courses that form a student's learning community. E-portfolios are being used by the nursing program at Three Rivers Community College to improve learning and for programmatic assessment and by the nursing program at Fairfield University for assessment and career purposes.

Why are e-portfolios an important learning and assessment tool for institutions both now and for the future? Higher education institutions in Connecticut began the process of responding to these questions in 2002 with the help of a grant from the Fund for Improvement of Post Secondary Education (FIPSE). Under the auspices of the Connecticut Distance Learning Consortium (CTDLC), eleven public, private, baccalaureate, and associate-degree-granting institutions began a collaborative project to answer these questions in terms of supporting students, improving teaching and learning, and promoting assessment. As the e-portfolio requirements of the partner institutions began to be clarified, the CTDLC created an e-portfolio platform to meet these needs and a network of e-portfolio project directors to support their implementation efforts. This chapter examines how the responses to these two questions have evolved and expanded over the past four years and how the CTDLC has supported institutional efforts to implement e-portfolios for learning and assessment purposes. Since the inception of the project, participating partners have expanded from eleven to thirty-one.

Assessment

Assessment in higher education is often used to mean two separate activities. First, the assessment of the individual student asks, How well is this student learning what we are (or at least think we are) teaching? Although helping the student understand what steps to take to improve is not always part of assessment, it is a critical element of individual assessment. Faculty have been responsible for this type of assessment for centuries using tests, essays, research papers, projects, experiments, problem sets, case studies, and other evaluative activities that result in a score or grade. But many would argue that faculty place too much reliance on methods such as tests, which require students to respond to questions about what they know

rather than more authentic types of assessment that evaluate students on how well they perform messy, real-world, intellectually challenging tasks (Wiggins, 1990). For example, instead of a test with questions on a historical period, authentic assessment methods might ask a student to use that knowledge to analyze an original document from that period. This requires students to use their knowledge and skills to construct meaning and produce a work that has value beyond a grade or score (Newmann and Wehlage, 1993). In effect, they are asked to do what historians do: create knowledge. Authentic assessment therefore results in a product and, if evaluated against specific criteria such as can be delineated in a rubric, a path for improvement. Authentic assessment is also often individualized to take into account the goals of individual students.

Second, *assessment* is used to refer to the set of activities that an institution, department, or program uses to evaluate itself. It asks two questions: How well is this program, department, or institution teaching what we say we want our students to learn? And, How can we use these data to improve our program and our teaching? While some institutions, such as Alverno College (2006), have done this type of assessment since the 1970s, many others have not. And at least in the view of some, these efforts have been inadequate: “Despite increased attention to student learning results by colleges and universities and accreditation agencies, parents and students have no solid evidence, comparable across institutions, of how much students learn in colleges or whether they learn more at one college than another” (Miller, 2006, p. 15).

Implicit in a desire for institutional assessment that allows for evidence that is comparable across institutions is a method such as standardized testing that generates scores, so we can learn that on the average, students at college A score X in critical thinking versus those at university B who score Y. However, like the proponents of authentic assessment, opponents of such methods argue that institutional assessment too must take into account the individualized missions of higher educational institutions and the specific learning objectives of programs and departments. This second view is exemplified by the *Nine Principles of Good Practice for Assessing Student Learning* (Astin and others, 1996), developed by the American Association of Higher Education. These principles place an emphasis on aligning assessment with the values and mission of the institution. They emphasize that assessment must be multidimensional, integrated, and authentic; it is best when it takes place throughout a student’s educational experience rather than a one-shot summative evaluation; and it involves a collaboration of faculty and staff throughout the institution.

Portfolios and Assessment

All portfolios, paper based or electronic, generally share three basic characteristics that allow them to be used as an assessment tool: (1) the ability to collect materials created for a variety of reasons over time, (2) the

ability to select from this collection and organize it, and (3) the ability to surround the work itself with additional information and content, including introductions and reflection. Portfolios are more than just giant files. Creating a portfolio requires that students select from the work they have saved in a portfolio and organize the materials for a specific purpose. This can include exhibiting the range of their skills and achievements, creating a representation of their best work, or demonstrating growth or change over time. Through prompts for reflections and introductions, faculty can encourage students to reengage with their work in a meaningful way. These prompts can ask students to examine a single piece of work in their portfolio or the entire collection and describe their learning process; discuss how they would approach similar assignments differently; highlight or criticize specific elements of their work; explain how this work meets a specific requirement, objective, or assignment; situate their work at a specific time in their development; or help the reader understand this particular portfolio. It is this continual meaningful reengagement, as students create and recreate their portfolios, that both enhances the learning process and allows portfolios to be used for authentic assessment.

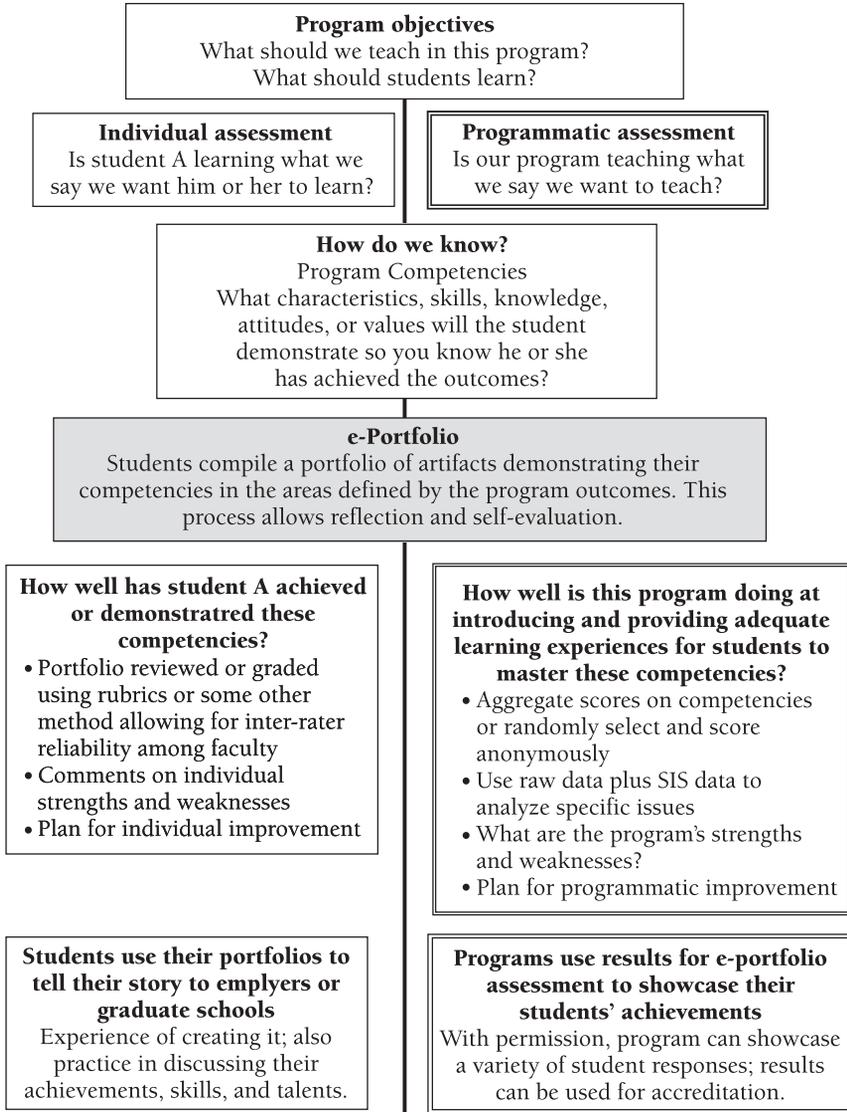
A Model for Individual and Programmatic Assessment

Portfolios, as an assessment tool, have the advantage of being able to be used simultaneously for both individual and programmatic assessment. As the model in Figure 3.1 indicates, this has advantages for both the individual and the program. As specified in the American Association for Higher Education (Astin and others, 1996) criteria for assessment, the model first requires that the program to be assessed clearly define its objectives. Next, it requires defining the competencies that students need to demonstrate in order to meet these objectives. Then it requires the program to specify the types of artifacts, that is, authentic examples of work, that students need to provide to demonstrate their learning. Portfolios are submitted to an instructor or committee for review and evaluation to answer the question of how well the student has demonstrated mastery of the required competencies. These same portfolios are saved and reviewed to answer the question of how well the program is doing at providing the appropriate learning opportunities for the specified competencies. Finally, portfolios provide a showcase for students and for the program or institution.

The “e” Advantage

Although this process is possible with paper-based portfolios, the electronic feature provides major advantages. For the institution, it eliminates closets full of looseleaf binders or file folders and moves storage to disks, hard drives, servers, and storage area networks. It allows the portfolio owner to

Figure 3.1. Portfolio.Org as a Tool for Program Assessment



Source: Goldsmith (2006, p. 5).

keep work over time without keeping track of individual pieces of paper or files on an individual computer. Any type of digital material or material that can be digitized can be placed in an e-portfolio, a major advantage in a world where many students are creating digital objects. The “e” makes

portfolios available any time and anywhere for both the owners of the portfolios and for those viewing and reviewing them. Their electronic nature also allow portfolios to be genuine, easily available showcases for purposes outside the institution, such as job searches. Rather than carting folios or binders about, students can invite guests to click on a link and review their work online at their leisure. The move to an electronic format has also meant that the notion of what a portfolio is has expanded and continues to change. E-portfolios can be an extremely flexible tool, with a student's single e-portfolio used for a multitude of purposes for a variety of audiences. Our partner institutions' students are not only using e-portfolios in their classes, but also working with career counselors, as part of their advising process, for cocurricular activities, athletics, special projects, and semesters abroad, all facilitated by the move to Web-based e-portfolios.

Connecticut's Experiences

An instructor who responded to a survey of e-portfolio users in spring 2006 had this to say: "The e-portfolio gave the students a chance to exercise reflective learning. The students were able to see their growth in different areas over time. As an instructor, I found the guest invitations an invaluable tool in gaining insight to assignments and topics being covered in class. The reflective piece also helped reveal characteristics of the student that may have not been revealed in class."

The participating institutions have found several major advantages of using e-portfolios for assessment purposes. Portfolios allow assessment of the students' actual work, achievements, or products. They can be used simultaneously to assess individual achievement (that is, how well the student is doing in meeting course or programmatic objectives) and to determine how effective courses, programs, departments, or institutions are in providing learning opportunities to ensure that students meet their goals and objectives. They require that the students understand the goals and objectives for which they are creating a portfolio. For example, some assessment methods may test a specific skill or scope of knowledge such as critical thinking skills, and they may require a faculty member to collect work that she believes evidences these skills or knowledge. E-portfolios require that students understand these skills or knowledge, can select work that demonstrates their skills or achievements in this area, and can reflect on why they have chosen this particular piece of work to meet the stated objective. As one of our community colleges found, this means that faculty need to discuss programmatic and general education objectives with their students to ensure they are clear about what is required to meet these objectives and how they will be assessed. They also need to ensure the students see how an individual course fits into this larger picture.

E-portfolios can be individually graded and commented on to provide students with feedback as to their competencies. Collectively e-portfolios

can be reviewed, using holistic scoring methods, rubrics, or random selection, to provide the program being assessed with information as to its strengths and weaknesses. Programs can assess which objectives students are meeting well and which require programmatic improvement. For example, with the adoption of e-portfolio, the dental hygiene faculty at a partner community college proposed a total curriculum revision that incorporated a capstone project course in the final semester prior to graduation. This course will focus on the students' best work, demonstrating their achievement of program goals and institutional outcomes for view on e-portfolio.

E-portfolios also allow revision over time. Instead of an assignment being handed in, graded, and then filed away, it can be added to a portfolio and revised, revisited, and reflected on. A writing faculty at one of the participating institutions has students complete a writing assignment and submit it for grading and comments. When it is returned, the students must add it to their e-portfolios and respond to a series of questions to help them reflect on their writing and how to improve it. At the end of the semester, these students must reflect on their entire semester's work. This is a highly metacognitive process that requires students to engage meaningfully with each piece of their work three times.

For students, compiling a portfolio provides the opportunity to connect their work in individual courses to the institutional outcomes. Students describe their ability to understand these connections as well as the connections between their own lives and their academic work. When students at one of the community colleges during their first semester of using e-portfolios were asked in a survey in spring 2006 what they liked best about them, they commented on how e-portfolios "made me think about myself and what I was doing," allowed the student to ". . . store work related to a specific goal," helped them make connections in that "I could group work and send it grouped," helped them in "organizing thoughts and goals," and "allows you to see how far you have advanced."

Ultimately the creation of e-portfolios results in both a product that an institution can use to demonstrate how well it is meeting its goals and a showcase for students to demonstrate their skills for personal or employment purposes. Even in the first semester of creating a portfolio, a student commented, "I really like using e-portfolios because it gives me a chance to show off the work that I am most proud of" (survey of e-portfolio users, spring 2006). Overall, as the participating institutions began to implement e-portfolios as a learning and assessment tool, students who initially resisted what appeared to be more work and the need to learn one more type of software were pleased that this work resulted in a tangible demonstration of their accomplishments. Faculty who may have resisted for many of the same reasons—extra, or at least different, work, and one more technological platform to master and teach with—were pleased with how students were using e-portfolios. Faculty using e-portfolios to connect learning community courses commented in the spring 2006 survey, "Students updated the

e-portfolio on a continuing basis and it was interesting to see the changes that they made throughout the semester. It was obvious that students completing the assignment were proud of their work and used the reflection, information, and comment sections to map their progress and what they learned from the new topics in the software applications class. It was most interesting that the assignments did show a connection between the learning community courses.”

Challenges

Working with institutions as they began to adopt e-portfolios was reminiscent of the beginnings of online education in Connecticut. That process was spearheaded by a few faculty, and in most cases it was uneven; few institutions had plans for creating online programs and services, and in many cases those who were teaching online had neither taught nor studied online. Many of the participating institutions began their e-portfolio implementation similarly. Their process was spearheaded by a few faculty or staff with no concrete plans for institutionalizing this adoption, no support system in place, and few faculty or staff who had ever created a portfolio, paper-based or electronic.

Some institutions moved from a paper-based portfolio system to an e-portfolio one. This did require learning some new technology but not major changes in pedagogy. However, most of these institutions did not have this experience. Moving to e-portfolios necessitated changes in assignments, workloads, and assessment methods. Because the major virtue of an e-portfolio is that it makes possible saving work over time, institutions had to grapple with the questions of which work, for what purpose, and for how long. For many institutions, these are ongoing questions, and in one or two that had no clear assessment strategies, no advocates for the required changes, or no skilled change agents, the move to adopt e-portfolios failed.

Implementing e-portfolios requires that faculty, staff, and students learn to use a new software package and understand the assumptions on which it was built. For faculty, understanding the e-portfolio platform affects the way they need to construct portfolio assignments and work with assessment activities. So training of faculty must have both technical and pedagogical components. E-portfolios emphasize self-assessment, reflection, and meta-cognitive skills. Many incoming students lack the educational sophistication those skills require, and many faculty have not taught these skills before. Pedagogical training for faculty should include discussions of the types of questions and assignments that help students gain these skills. It is also helpful for departments to create a plan so that it is clear in which courses students will be introduced to such skills and how those skills will be practiced and enhanced as students take more advanced courses.

Too often while faculty were learning the platform, they were also trying to train students. Institutions that have been most successful at implementing e-portfolios have planned how and where training of both faculty

and students will occur and clearly designated which courses and programs will implement the platform. Many institutions have planned to introduce e-portfolios in first-year orientation courses, but some, especially in community colleges, have found that a significant number of students do not come with adequate computer skills and are overwhelmed by learning the course management system, the portal, and the e-portfolio. Careful planning, pre-enrollment computer skills remediation, and good training have helped these institutions successfully deal with these barriers. Successful institutions also provided trained staff (often peers) who are available in specific locations at designated times to help students and faculty with e-portfolio issues. This is important even though the CTDLC offers telephone and e-mail support to users. Students and faculty tend to use the CTDLC help desk for technical problems and their own support systems for a better understanding of how to work within the system. Here again, as they implemented their learning management systems, the lessons institutions learned about help desks, training, workshops, teaching and learning centers, and peer support provided a model for an institutional e-portfolio implementation plan.

The Platform Dilemma

One major challenge for most institutions is the decision of which platform to use. When the CTDLC began this project, it decided to build a portfolio platform because the only e-portfolio platforms available were those built by individual institutions to meet their specific needs. Today, in response to the growth in demand, e-portfolio platforms are widely available (EduTools, 2007). Choosing the appropriate platform has become a complex issue. It is essential to remember that e-portfolios are a tool that needs to be matched to the institutional purpose or purposes. The following questions can form a basis from which to structure the institutional platform conversation:

- What need is driving the search for an e-portfolio platform?
- Are there future needs that must be considered? Kent State built a wonderful platform for a portfolio dedicated to career counseling and job search issues, but now the institution is considering portfolios for other uses (A. Motayar, personal communication, 2005). Does it throw out what it built, try to adapt it, or use several platforms?
- Who is the e-portfolio for: students, faculty, the institution, potential employers?
- Who is going to see it?
- Will it be reviewed and graded?
- Are students mostly technically savvy, or do many (for example, returning adult students or students who have not grown up with computers) come with more limited technical skills?
- How knowledgeable are the faculty and staff in using portfolios and adopting new technologies?

- How will implementation grow? Is this just for one department or program, or will it be used across the institution—for general education assessment, for example?
- Who is the change agent here?
- Who will support the implementation of e-portfolios? Who might resist? What will aid in overcoming any resistance?
- What resources are available? Does the institution have enough instructional technology staff and substantial resources, or are support staff limited?
- Will the e-portfolio be integrated into a learning management or student information system? Public institutions may want to consider initiatives that use a single e-portfolio platform to link students in K–12, community colleges, and state colleges and universities.
- Is the primary focus assessment? If so, consider connections to learning objectives, rubric builders, anonymous scoring, and how long portfolios will be kept by the institution.
- Who owns the material in the e-portfolio, and who determines who can see it? Can anyone find and see a student's portfolio, or is there protection for privacy and to inhibit plagiarism?
- Does access to students' e-portfolios conform to FERPA (Family Educational Rights and Privacy Act)? Is it compliant with the Americans with Disabilities Act?

There may be other institution-specific questions that need to be considered before buying or building a platform.

Although using these questions in analyzing institutional needs is important, it is also important not to let the question of which platform to use derail the e-portfolio project. There is no way for an institution to pick or even build a perfect platform. Given all of the options for implementing portfolios, it is impossible to ensure that everyone's needs are met 100 percent of the time. Large institutions may be able to pick more than one platform or build one that can be continually adapted to changing needs, but in most cases institutions need to pick or build what they think is best and then, as Tom Lewis (2004) says, alter practices, curriculum, and processes to work with that platform.

One faculty member noted in the 2006 survey: "It is a challenge to get people to use the rich, flexible tool 'as is' (meets 90 percent of their needs) rather than looking at it and finding reasons not to use it. When folks say, 'This is a really great tool, but we cannot use it because it lacks X,' they are often simply resisting altering existing practices, curriculum, or processes. How can we get beyond this?"

There are always trade-offs in any platform, whether institutionally built or purchased. Having students create their portfolios using HTML or HTML editors favors originality and graphic skills. Using a forms- or a template-based system requires fewer computer skills for both students and faculty but may not tap on creativity. Cost is an issue, and decisions on plat-

forms may rest not only on the costs but also on how those costs are distributed. There is the cost of developing, buying, or, in the case of open source, adapting the software. There is the cost of the hardware and the staff to run it. An ASP (application service provider) model, such as the CTDLC's, shares the costs of hardware, software development, and support, but at the cost of a unique solution for each institution.

Regardless of how an institution decides to distribute the costs of the software and hardware, there are additional costs that must be figured into adopting e-portfolios, including the need for technical support and training for faculty and students. Participating institutions that have been the most successful in implementing e-portfolio have clearly defined places and times when students can get help with e-portfolios. These are often staffed by trained students. Faculty need technical training and support, but unless they are moving from a paper-based system, there is an even greater need for pedagogical support and training to help faculty and staff understand how to use portfolios effectively.

Success Breeds Success

As faculty, staff, and students discovered the richness of the tool for teaching, learning, assessment, and as a showcase, their enthusiasm provided the major impetus to move the adoption of e-portfolios in other parts of their institution. The advantage of working in a consortium is that each institution was able to learn from these successes and challenges. Although their institutional missions are different and their reasons for adopting e-portfolios differed greatly, the process of the participating institutions' answering and then reevaluating their responses to the question, "Why are electronic portfolios an important learning and assessment tool for institutions?" provided an enormous amount of information on how to improve the functionality of the platform and increase the impact of e-portfolios within a single institution. As one of the participants explained to the external evaluator of our FIPSE grant, "The current e-portfolio is light years ahead of where we started and any one of us working alone would not have gotten half as far" (Brown, 2006).

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